

CLAIMS

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I claim:

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1. A multi-component, longitudinally continuous extrusion suitable for use in the fenestration, decking and remodeling industries, comprising:

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a first, high density composite member consisting of a thermoplastic component and a cellulosic fiber component extruded from a primary extruder into an extrusion die, wherein the first member has inner and outer sidewalls defining a high density, thin wall extrusion having at least one enclosed, hollow interior compartment; and,

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a second, low density foamed member consisting of a foamed thermoplastic polymer, coextruded with the first member in a molten state from a secondary extruder into the extrusion die so as to be laterally coextensive with and molecularly bonded to one of the sidewalls of the first member.

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2. The multi-component, longitudinally continuous extrusion of Claim 1, wherein the thermoplastic component of the first high density member has polyvinyl chloride as a principle component by weight.

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3. The multi-component, longitudinally continuous extrusion of Claim 1, wherein the foamed thermoplastic component of the second member has a substantial cellulosic fiber content.

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4. The multi-component, longitudinally continuous extrusion of Claim 3, wherein the foamed thermoplastic component has polyvinyl chloride as a principle component by weight.

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5. The multi-component, longitudinally continuous extrusion of Claim 3, wherein the foamed thermoplastic

0 component has styrene acrylonitrile as a principle
component by weight.

6. The multi-component, longitudinally continuous
extrusion of Claim 1, wherein the second member is
5 laterally adjacent to, and longitudinally coextensive with
the inner sidewall of the first high density member.

7. The multi-component, longitudinally continuous
extrusion of Claim 1, wherein the second member is
10 laterally adjacent to and longitudinally coextensive with
the outer sidewall of the first high density member.

8. The multi-component, longitudinally continuous
extrusion of Claim 1, wherein the second member is
15 laterally adjacent to and longitudinally coextensive with
both the inner and outer sidewalls of the first high
density member.

9. The multi-component, longitudinally continuous
20 extrusion of Claim 1, including a third member consisting
of a thermoplastic cap laterally adjacent to and
coextensive with a laterally outermost one of the first
and second members of the multi-component extrusion,
wherein the thermoplastic cap is coextruded from a
25 tertiary extruder into the extrusion die substantially
simultaneously with the first and second members so as to
be molecularly bonded with the laterally outermost member.

30 10. The multi-component, longitudinally continuous
extrusion of Claim 9, wherein the extrusion defines left
hand and right hand sides, and wherein the thermoplastic
cap has a highly weatherable thermoplastic polymer on the
left hand side and a highly paintable thermoplastic
35 polymer on the right hand side.

0 11. The multi-component, longitudinally continuous
extrusion of Claim 10, wherein the highly weatherable
thermoplastic polymer has polyvinyl chloride as a
principle component by weight, and wherein the highly
paintable thermoplastic polymer has acrylic styrene
5 acrylonitrile (ASA) as a principle component by weight.

12. A multi-plate extrusion die of the type having
a plurality of die plates sequentially positioned so as to
define upstream and downstream directions, comprising:
10 an introductory plate generally defining a primary
aperture for passage therethrough of a primary extrudate,
the primary aperture extending longitudinally through
substantially each die plate of the extrusion die;
a mandrel plate downstream of the introductory plate
15 and fluidly connected thereto for receipt of the primary
extrudate and a secondary extrudate, having a first
elongated mandrel substantially suspended therein by first
support means for supporting the first mandrel in a spaced
apart relationship within the primary aperture, wherein
20 the first mandrel is substantially hollow and has a second
mandrel substantially suspended therein by second support
means for supporting the second mandrel in a spaced apart
relationship within the first mandrel so as to form an
elongated hollow, interstitial void between the first and
25 second mandrels; and,
a secondary plate positioned between the introductory
and mandrel plates having means for introducing the second
extrudate into the interstitial void, whereby an elongated
final extrudate having at least two different
30 longitudinally continuous, molecularly bonded
thermoplastic components can exit the mandrel plate.

13. The multi-plate extrusion die of Claim 12,
including a capstock plate, positioned downstream of the
mandrel plate, for adding a third extrudate in the form of
35 a capstock to the final extrudate.

0 14. The multi-plate extrusion die of Claim 12, wherein the first and second support means are elongated, tapered fins having a decreasing thickness from the upstream direction to the downstream direction.

5 15. A method of making a multi-component, longitudinally continuous extrusion suitable for use in the fenestration, decking and remodeling industries with a multi-plate extrusion die of the type having a plurality of die plates sequentially positioned so as to define
10 upstream and downstream directions, comprising the steps of:

preparing a thermoplastic primary extrudate and a thermoplastic secondary extrudate;

introducing the primary extrudate in a molten state
15 into an introductory plate generally defining a primary aperture for passage therethrough of the primary extrudate, wherein the primary aperture extends longitudinally through substantially each die plate of the extrusion die;

20 positioning a mandrel plate downstream of and fluidly connected to the introductory plate, wherein the mandrel plate has a first elongated mandrel suspended in a spaced apart relationship within the primary aperture and wherein the first mandrel is substantially hollow and has a second
25 mandrel substantially suspended therein in a spaced apart relationship within the first mandrel so as to form an elongated, hollow, interstitial void between the first and second mandrels; and,

introducing the secondary extrudate in a molten state
30 into the interstitial void, whereby an elongated final extrudate having at least two different longitudinally continuous, molecularly bonded thermoplastic components exit the mandrel plate.

35 16. The method of Claim 15, wherein the first extrudate is prepared so as to substantially consist of a

0 thermoplastic component and a cellulosic fiber component,
and wherein the second extrudate is prepared so as to
substantially consist of a foamed thermoplastic polymer.

17. The method of Claim 16, wherein the second
5 extrudate includes a substantial cellulosic component.

18. The method of Claim 15, including the step of
providing a third thermoplastic capstock extrudate,
positioning a capstock plate downstream of the mandrel
10 plate, introducing the third extrudate in a molten state
to an exterior surface of the final extrudate so as to
form a cap.

19. The method of Claim 18, wherein the final
15 extrudate defines left hand and right hand sides,
including the steps of simultaneously applying two
different types of thermoplastic capstocks to the final
extrusion, one of the thermoplastic capstock materials
consisting of a highly weatherable thermoplastic polymer
20 on the left hand side and another of the thermoplastic
capstock materials consisting of a highly paintable
thermoplastic polymer on the right hand side.